Comment on "Partitioning tropical oceanic convective and stratiform rains by draft strength" by David Atlas et al.

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1. Initial Comment

[1] The crux of this comment is to clarify attribution. If someone looks at a published graph and has a different interpretation from that of the original authors, that new interpretation should not be attributed to the original authors.

[2] The references given by *Atlas et al.* [2000] regarding distinct convective and stratiform reflectivity *Z* to rain rate *R* relations attributed to *Yuter and Houze* [1997] are incorrect. The convective and stratiform *Z-R* relations labeled as those of Yuter and Houze in Table 3 (incorrectly referred to there as 1996) and mentioned in the text on pp. 2262, 2264, and 2265 of *Atlas et al.* [2000] do not appear anywhere in the *Yuter and Houze* [1997] paper. The *Yuter and Houze* [1997] study used two-dimensional (2-D) particle probe drop spectra collected by the National Center for Atmospheric Research Electra aircraft during the Tropical Ocean-Global Atmosphere (TOGA) Coupled Ocean-Atmosphere Response Experiment (COARE) to compute *Z* and *R* values over 6 s intervals of flight track (~1400 L sample volumes). These data were classified into convective and stratiform subsets using radar data obtained by the National Oceanic and Atmospheric Administration WP-3D airborne radar. Segments of the Electra flight track were categorized by noting when the Electra flew within regions of convective and stratiform precipitation classified according to a radar reflectivity texture algorithm based on the paper by *Steiner et al.* [1995]. The main conclusion of the *Yuter and Houze* [1997] study was that the populations of radar-classified convective and stratiform *Z-R* points overlapped in db*Z*-log *R* space and did not form two statistically distinct populations.

[3] The previous statements do not rule out the possibility that different physical processes can yield different drop size distributions (DSD) [e.g., *Braun and Houze*, 1994, pp. 2749–2750]. However, in the large areas of radar-classified convective and stratiform precipitation examined in this study, the physical processes mixed, exhibited natural variation, and were subject to sampling error to such a degree that the *Z* and *R*values associated with the DSD samples in the convective and stratiform populations did not form distinct populations. A classification method that can truly distinguish between dominant precipitation growth by vapor deposition versus accretion (riming and collection/coalescence) would have the property of yielding distinct populations in low-rain-rate regions of db*Z*-log *R* space where both processes are known to occur.

2. Follow-up

[4] In response to the reply by *Atlas et al.* [2002], the following points should be made. We are mystified as to why D. Atlas and his coauthors would use a rain rate threshold of 10 mm h^{-1} [*Atlas et al.*, 2002, Table 1] to classify the DSD samples into convective and stratiform subsets. Such a classification is inconsistent with both the radar-based classification used by *Yuter and Houze* [1997] and the vertical-velocity-based classification used by *Atlas et al.* [2000]. It is well accepted that vapor deposition, the dominant, but not exclusive, precipitation growth process in stratiform precipitation regions [*Houghton*, 1968; *Houze*, 1997], cannot usually produce rain rates >10 mm h^{-1}. However, it is also well known that both vapor deposition and accretion processes can yield rain rates ≤10 mm hr^{-1} and hence that a rain rate threshold method cannot correctly delineate between convective and stratiform precipitation regions [e.g., *Steiner et al.*, 1995, Figure 9].

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